

ABSTRACT

Broadly defined sol-gel films for the coating of solid substrates, wherein such sol-gel films provide effective and durable antimicrobial properties, are provided. The utilization of such films permits relatively low-temperature production of antimicrobial substrates, such as ceramics, metals (e.g., stainless steel, brass, and the like), plastics (e.g., polyimides), glass (e.g., borosilicates, and the like), as compared with typical glazes for ceramics and the like. The inventive films comprise, as the primary antimicrobial active ingredients, certain inorganic antimicrobial compounds, such as, preferably, metal-containing ion-exchange, oxide, and/or zeolite compounds (most preferably, including silver therein as the metal component). Preferably, also, the particular solid substrate to which such films are applied should exhibit substantially high melting and/or heat distortion temperatures to permit high temperature curing of the films to the solid substrate surface (in the range of 300-800°C, for example). If the solid substrate melts or distorts, the antimicrobial activity of the ultimate composite is drastically reduced. End uses for such film-coated articles include bathroom fixtures, furniture, and any other surface that exhibits the high melt and/or heat distortion temperatures noted above and requires antimicrobial characteristics. The specific method of producing such films is also encompassed within this invention.